

# CEO DUALITY, DIGITAL GOVERNANCE, AND ENVIRONMENTAL, SOCIAL, GOVERNANCE: INNOVATION-DRIVEN FIRM VALUE IN THE DIGITAL ERA

Hendra Galuh Febrianto <sup>\*</sup>, Mikrad <sup>\*\*</sup>, Amalia Indah Fitriana <sup>\*\*</sup>,  
Abdul Karim <sup>\*\*</sup>, Luqman Hakim <sup>\*\*\*</sup>, Andry Priharta <sup>\*\*\*</sup>

<sup>\*</sup> Corresponding author, Faculty of Economics and Business, Universitas Muhammadiyah Tangerang, Kota Tangerang, Indonesia; Universitas Muhammadiyah Jakarta, Tangerang Selatan, Indonesia

Contact details: Faculty of Economics and Business, Universitas Muhammadiyah Tangerang, Jl. Perintis Kemerdekaan I No. 33, Kota Tangerang, Banten 15118, Indonesia

<sup>\*\*</sup> Faculty of Economics and Business, Universitas Muhammadiyah Tangerang, Kota Tangerang, Indonesia

<sup>\*\*\*</sup> Universitas Muhammadiyah Jakarta, Tangerang Selatan, Indonesia



## Abstract

**How to cite this paper:** Febrianto, H. G., Mikrad, Fitriana, A. I., Karim, A., Hakim, L., & Priharta, H. (2026). CEO duality, digital governance, and environmental, social, governance: Innovation-driven firm value in the digital era. *Corporate Governance and Sustainability Review*, 10(2), 56–65. <https://doi.org/10.22495/cgsrv10i2p5>

Copyright © 2026 The Authors

This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0). <https://creativecommons.org/licenses/by/4.0/>

**ISSN Online:** 2519-898X  
**ISSN Print:** 2519-8971

**Received:** 11.09.2025  
**Revised:** 10.10.2025; 17.02.2026  
**Accepted:** 03.03.2026

**JEL Classification:** C38, G34, M14, O32, Q56  
**DOI:** 10.22495/cgsrv10i2p5

In the era of digital transformation and increasing sustainability demands, corporate governance has become a critical factor in creating company value (Uddin et al., 2021). This phenomenon is not only occurring at the global level but also in Indonesia, where companies are beginning to adopt digital corporate governance (DCG) practices and focus on environmental, social, and governance (ESG) performance as part of their business strategy (Uzliawati et al., 2023). This study investigates the impact of corporate governance structures, technological innovation, and sustainability performance on firm value among publicly listed companies in Indonesia. The analysis, employing structural equation modelling-partial least squares (SEM-PLS), is based on a sample of 120 firms spanning the period from 2020 to 2024. The findings reveal that robust governance mechanisms and digital innovation significantly enhance sustainability outcomes, which in turn positively influence firm value. These results underscore the strategic importance of aligning governance practices with innovation and ESG initiatives to drive long-term value creation. The study contributes to the literature on emerging markets by highlighting the role of integrated governance and innovation frameworks in enhancing corporate performance. Practical implications are presented for policymakers and corporate leaders seeking to enhance governance and foster sustainable digital transformation.

**Keywords:** CEO Duality, Digital Corporate Governance, ESG Performance, Emerging Markets, Firm Value, SEM-PLS, Sustainability, Technological Innovation

**Authors' individual contribution:** Conceptualization — H.G.F., L.H., and A.P.; Methodology — M., A.I.F., and A.K.; Validation — M., A.I.F., and A.K.; Writing — Original Draft — H.G.F., A.I.F., and A.P.; Writing — Review & Editing — H.G.F., A.I.F., and L.H.; Supervision — L.H. and A.P.; Funding Acquisition — H.G.F. and A.I.F.

**Declaration of conflicting interests:** The Authors declare that there is no conflict of interest.

**Acknowledgements:** The Authors want to express our sincere gratitude to the Ministry of Education, Culture, Research, and Technology for the research grants No. 125/C3/DT.05.00/PL/2025 and No. 7935/LL4/PG/2025, which it has provided.

## 1. INTRODUCTION

In the era of digital transformation and increasing sustainability demands, corporate governance has become a critical factor in creating company value (Uddin et al., 2021). This phenomenon is not only occurring at the global level but also in Indonesia, where companies are beginning to adopt digital corporate governance (DCG) practices and focus on environmental, social, and governance (ESG) performance as part of their business strategy (Uzliawati et al., 2023). However, the complexity of the leadership structure, including the dual role of the chief executive officer (CEO), and the challenges of integrating digital technology into corporate governance, remain problems that need to be overcome.

In Indonesia, cases such as the corruption scandal at PT Garuda Indonesia and the governance failures at PT Asuransi Jiwasraya highlight the importance of effective leadership structures and transparency in decision-making (Kumandang & Hendriyeni, 2021). CEO duality, where an individual serves as both CEO and chairman of the board of directors, is often considered a contributing factor to the lack of checks and balances in strategic decision-making (Suherman et al., 2023). This can lead to conflicts of interest and a decline in the company's value (Zahid et al., 2024). On the other hand, DCG, which utilises technologies such as blockchain and artificial intelligence (AI) to enhance transparency and accountability, is being adopted by companies (Mikrad et al., 2022). However, its implementation still faces obstacles, including a lack of resources and inadequate infrastructure readiness (Ren et al., 2023).

In addition, the issue of sustainability and corporate social responsibility is increasingly receiving attention from investors and stakeholders (Febrianto et al., 2025). ESG performance has become a crucial indicator in evaluating a company's sustainability (Wu et al., 2024). A study by Bukari et al. (2024) shows that companies with good ESG performance tend to have higher company values. However, in Indonesia, many companies have not fully integrated ESG practices into their business strategies, thereby hindering the potential for increasing company value (Rahmaniati & Ekawati, 2024). Four primary inquiries are examined in this research:

*RQ1: What is the effect of chief executive officer duality on the value of a company?*

*RQ2: What is the impact of digital corporate governance on the value of a business?*

*RQ3: Are technology innovation and environmental, social, and governance performance intermediaries in the linkages between chief executive officer duality, digital corporate governance, and firm value?*

*RQ4: In the Indonesian context, what processes are involved in the connection between corporate governance and company value?*

The research integrates agency theory and dynamic capacities to investigate how traditional and digital governance structures impact a company's value in a developing market by examining paths of innovation and sustainability.

Research related to CEO dualism, DCG, technological innovation, and ESG performance has

been widely conducted in recent years. However, most research remains focused on the context of developed countries, with limited attention to developing countries, such as Indonesia (Bukari et al., 2024). Additionally, research that integrates these four variables in a single analysis model remains limited. Several recent studies, such as the one conducted by Wang and Yang (2024), have identified the importance of DCG in enhancing corporate value; however, few have explored the mediating role of technological innovation and ESG performance.

The novelty of this research lies in integrating key variables into a single analysis model and focusing on the Indonesian context, which has not been extensively explored in the literature before. The study also introduces technological innovation and ESG performance as mediating variables, which provides a deeper understanding of the mechanisms that link corporate governance to corporate value (Wu & Li, 2023).

The structure of this paper is as follows. Section 2 presents a comprehensive review of the relevant literature, including theoretical foundations and prior empirical findings related to CEO duality, DCG, technological innovation, and ESG performance. Section 3 outlines the research methodology, detailing the data sources, variable operationalization, and analytical techniques employed to examine the proposed model. Section 4 discusses the empirical results, highlighting key findings and their implications. Section 5 provides a critical analysis of the results in light of existing theories and contextual factors specific to Indonesia. Finally, Section 6 concludes the paper by summarizing the main contributions, outlining limitations, and offering recommendations for future research and policy development.

## 2. LITERATURE REVIEW

### 2.1. Chief executive officer duality and technological innovation

The concept of CEO duality, which involves an individual serving as both the CEO and the chairman of the board of directors simultaneously, has been a significant topic of debate in the fields of corporate governance and organisational planning (Debnath et al., 2021). A few individuals believe that the presence of two CEOs can expedite decision-making and ensure accountability, while others are concerned about the potential for conflicts of interest and the absence of independent monitoring (Omar & Owusu-Amoako, 2023). Understanding the importance of CEO duality is becoming increasingly significant in the context of technical innovation, which serves as a primary catalyst for economic development and competitive advantage in the digital era (Wang & Yang, 2024).

The presence of two CEOs can hinder a corporation's ability to generate novel concepts. On the one hand, centralised leadership can expedite the decision-making process regarding the investment in new technology (Besim, 2023). Conversely, the board of directors' lack of autonomy can impede the development of novel ideas and creativity (Jagirani et al., 2023). In Indonesia, where

authoritarian rule is the norm, the presence of two CEOs can hinder the development of new technologies (Mikrad et al., 2022).

The corporate governance literature has devoted considerable attention to the relationship between technological innovation and leadership structure. Nevertheless, a significant research gap remains regarding the mechanisms by which CEO duality influences innovation outcomes, particularly in technology-driven and dynamic environments. A recent study by Mohapatra et al. (2025) in technological forecasting and social change found that the prevalence of unilateral decision-making and inadequate board supervision frequently stifles innovation in European firms due to CEO duality. However, these findings are inconsistent in the context of developing countries. In contrast, Tang et al. (2022) found that CEO duality strengthens innovation capacity by accelerating strategic decision-making and facilitating a more efficient allocation of research and development (R&D) resources.

The inconsistency of these findings suggests that the influence of CEO duality is highly dependent on the institutional context; however, previous research has failed to provide an in-depth understanding of the mediation mechanisms that explain how this leadership structure affects the innovation process. Furthermore, although some studies have examined moderation variables such as board size or institutional ownership (Wijethilake & Ekanayake, 2020), there are still very few studies that examine the role of organisational innovation culture or a company's digital capabilities as mediators in the relationship between CEO duality and technological innovation. In addition, the measurement of innovation is still dominated by quantitative indicators, such as the number of patents or R&D expenditure (Azzam, 2022). Qualitative aspects, including the type of innovation (radical vs. incremental) or the long-term sustainability of innovation, are rarely explored.

## 2.2. Digital corporate governance and technology innovation

Digital transformation has revolutionised corporate governance practices, giving rise to the concept of DCG, which involves integrating digital technology, data-driven decision-making, and adaptive oversight mechanisms into governance structures and processes (Liu & Feng, 2025). According to Hanisch et al. (2023), DCG is not just the adoption of digital tools, but a strategic shift in the way the board of commissioners supervises, directs, and responds to technological changes. This definition is reinforced by Ren et al. (2023), who emphasise that DCG encompasses the dynamic capabilities of boards in understanding digital innovation, managing cyber risk, and proactively supporting organisational transformation. Hacioglu and Aksoy (2021) added that DCG reflects an organisation's ability to align digital strategies with governance accountability, including data-driven transparency and real-time decision-making.

Empirical studies indicate that companies with strong digital capabilities, as measured by the board's digital expertise, the use of digital

monitoring systems, and effective data governance, tend to achieve higher innovation performance (Jie et al., 2025). Councils with members who have technology backgrounds have proven to be more effective in allocating R&D resources and supporting high-risk innovation projects (Lane et al., 2024). Additionally, the application of blockchain for transparency and cybersecurity systems enhances stakeholder trust and fosters open innovation collaboration (Ahmed, 2025; Alsulami, 2025).

However, the DCG also brings challenges. Hanisch et al. (2023) warn that the authority of algorithms and automation can erode human strategic considerations if not managed in a balanced manner. On the other hand, digital literacy inequality between board members can create barriers to innovative decision-making (Zhang & Zhang, 2025).

## 2.3. Technological innovation and corporate value

Technological innovation has become a key driver of corporate growth and value creation in the era of the knowledge-based economy. According to Anderson (2014), the concept of creative destruction posits that innovation is not merely the improvement of processes but rather the agent of transformation that replaces the old market structure with a new one, thereby creating a sustainable competitive advantage. In the modern context, technological innovation, encompassing the development of new products, digital-based production processes, or technology-based business models, directly impacts a company's financial performance and value (Beulen & Bode, 2021; Yan et al., 2021).

Empirical studies show a strong positive relationship between technological innovation and company value, which is often measured through Tobin's Q or market-to-book value. Research by Duque-Grisales et al. (2020) found that companies with high R&D intensity and a significant number of patents exhibit higher market value, particularly in the technology, pharmaceutical, and advanced manufacturing industries. This is supported by Wang and Yang (2024), who stated that innovation not only improves operational efficiency but also strengthens brand position, bargaining power in the market, and investors' expectations for future growth.

Furthermore, innovation impacts the company's value through several paths: 1) the creation of superior products that increase market share; 2) automation and cost efficiency through the adoption of digital technology; and 3) increased reputation and investment attractiveness as innovative companies (Sun et al., 2023). In the context of digital transformation, companies that adopt AI, Internet of Things (IoT), and big data analytics exhibit faster value growth than their conventional counterparts (Zhao & Cai, 2023).

However, these relationships are not always linear. Some studies, such as those by Cui (2024), warn that innovations that are too risky or not aligned with the core strategy can waste resources and lower market value. In addition, the time lag between innovation investment and value realisation is often long, so companies face short-term pressure from the capital market (Duque-Grisales et al., 2020).

## 2.4. Chief executive officer duality and environmental, social, and governance performance

Chief executive officer duality, in which one person serves as both CEO and chairman of the board, has been a long-standing topic of debate in corporate governance literature. According to agency theory, Doku et al. (2023) suggest that this structure has the potential to generate conflicts of interest by weakening independent supervision systems, thereby eroding accountability and transparency. In the context of ESG performance, which focuses on social responsibility, sustainability, and strong governance, CEO dualism is frequently viewed as a barrier to the company's commitment to substantial ESG policies.

A few recent studies have found a negative relationship between CEO duality and ESG performance. According to Yu (2023), a survey of Fortune 1000 businesses found that companies with CEO duality have lower ESG scores, particularly in the governance and social dimensions, because power domination reduces the variety of opinions and board involvement in sustainability concerns. García-Sánchez et al. (2020) present a single theme, indicating that a hierarchical organisational structure (CEO and *ketua*) has a positive correlation with transparency in decision-making and commitment to reducing carbon emissions.

However, other research gives results that are ambiguous or contextual. According to stewardship theory, a CEO who simultaneously serves as presiding officer can act as an organisation's steward, particularly if they possess a long-term vision and a commitment to sustainability (Ju Ahmad et al., 2017). In developing nations, such as China, Zahid et al. (2024) found that CEO duality may not always harm ESG performance, especially in enterprises with significant family ownership and long-term incentives that align with ESG principles. This suggests that the impact of CEO duality is variable, depending on the institutional environment, ownership, and stakeholder pressures.

Some scholars believe that CEO dualism impedes ESG through intermediary channels, such as inadequate ESG committees, uneven resource allocation, and poor control of non-financial risks (Bhat et al., 2023; Dwianika et al., 2024; Mohapatra et al., 2025). In times of crisis or digital transformation, centralised leadership can accelerate the adoption of ESG initiatives if it is supported by a strong commitment from the organisation's senior management (Zhao & Cai, 2023).

## 2.5. Digital corporate governance and environmental, social, and governance performance

Digital corporate governance occurs when digital technologies, such as data analytics, AI-driven monitoring, and cybersecurity frameworks, are applied in corporate governance to enhance transparency, accountability, and strategic oversight (Grove et al., 2020; Wang & Yang, 2024). DCG is increasingly being recognised as a means of enhancing ESG governance, as ESG performance becomes a crucial indicator of long-term value creation. Digital solutions enable boards to monitor ESG risks in real-time, ensure the accuracy of sustainability reports, and engage stakeholders more effectively, all of which are critical components of successful ESG performance (Sun et al., 2023).

Recent research suggests a positive relationship between DCG and ESG outcomes. Companies with technology-savvy boards and robust data governance systems are more likely to establish quantifiable ESG objectives, provide transparency about non-financial information, and proactively address environmental and social risks (Wang & Yang, 2024). For example, employing blockchain technology facilitates the traceability of commodities in supply chains, immediately improving the environmental and social elements of ESG (Yang & Jin, 2024). AI-powered analytics can also identify gaps in workforce diversity and energy inefficiencies, allowing for targeted ESG reforms.

However, the link is not working correctly. An excessive reliance on algorithms for decision-making may limit people's ability to make informed moral choices, and inadequate data privacy protocols may impact governance scores (Rahmaniati & Ekawati, 2024). Furthermore, the benefits of DCG are more pronounced in established areas with robust digital infrastructure, raising questions about its effectiveness in emerging economies.

## 2.6. Environmental, social, and governance performance and company value

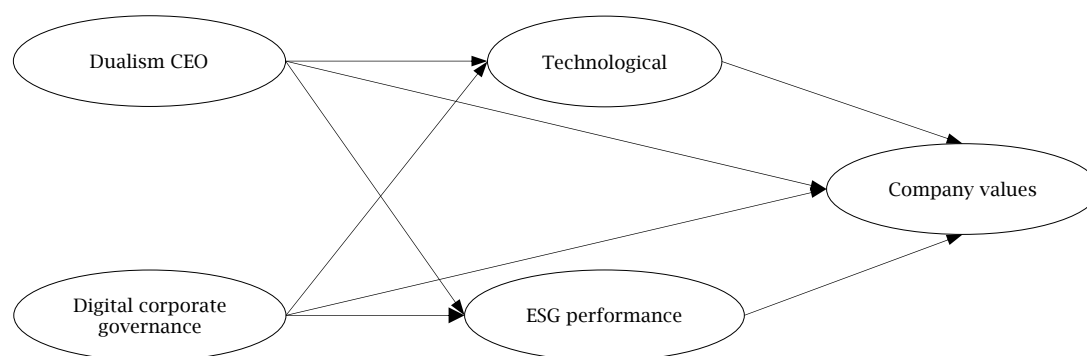
In the era of sustainable finance, ESG performance has become a crucial factor in determining a company's value. A growing body of research suggests that superior ESG performance is linked to higher company value, as measured by Tobin's Q, the market-to-book ratio, and shareholder returns (Sun et al., 2023). According to stakeholder theory and the resource-based view, ESG investments enhance reputation, mitigate regulatory and operational risks, increase staff productivity, and foster investor confidence, all of which contribute to greater long-term financial success.

Empirical studies have continuously validated this correlation. In a large-scale analysis of global corporations, Agbakwuru et al. (2024) found that companies with high ESG ratings outperformed their peers in terms of future cash flows and stock performance, particularly in locations prone to environmental and social hazards. According to Huang and Zhang (2025), firms with high ESG ratings attract more patient capital and have lower capital expenses, which contributes to their market premium.

Nonetheless, certain studies show inconsistent or contextually contingent results. Emerging markets often exhibit a weaker link between ESG values and performance due to lower institutional enforcement, greenwashing issues, and reduced investor appetite for sustainability (Masud et al., 2025). Iazzolino et al. (2023) further warn that the market prioritises substantial ESG issues that have a direct impact on financial performance over those that are immaterial. This suggests that the quality and relevance of ESG disclosures are more important than their quantity.

Recent evidence highlights the importance of transparency and third-party assurance in strengthening the relationship between ESG value and its impact. Companies that have their sustainability reports reviewed by an outside party attract more market attention, demonstrating that legitimacy boosts the value of ESG (Bhat et al., 2023).

Figure 1. Conceptual framework of research



## 2.7. Hypothesis

Building upon the theoretical foundations of agency theory and dynamic capabilities, this study explores the multifaceted relationship between corporate governance structures and firm value in the context of digital transformation and sustainability. Prior literature has highlighted CEO duality as a governance mechanism that may compromise board independence and strategic oversight, potentially leading to adverse outcomes in firm performance (Suherman et al., 2023; Zahid et al., 2024). Conversely, digital governance — characterized by the integration of advanced technologies such as blockchain and AI — has emerged as a strategic enabler of transparency, accountability, and operational efficiency (Mikrad et al., 2022; Ren et al., 2023).

In parallel, ESG performance has gained prominence as a critical metric for assessing corporate sustainability and stakeholder engagement, with empirical evidence suggesting its positive association with firm value (Bukari et al., 2024; Wu et al., 2024). Technological innovation, meanwhile, serves as a dynamic capability that enables firms to adapt, compete, and create value in rapidly evolving environments.

Despite these insights, limited research has examined the mediating roles of technological innovation and ESG performance in the nexus between governance structures and firm value, particularly within emerging markets such as Indonesia. This study addresses this gap by proposing a conceptual framework that integrates CEO duality, digital governance, technological innovation, and ESG performance to explain variations in firm value.

Accordingly, the following hypotheses are formulated to test the proposed relationships empirically.

*H1: Chief executive officer duality affects company value.*

*H2: Digital corporate governance affects company value.*

*H3: Chief executive officer duality affects technological innovation.*

*H4: Digital corporate governance affects environmental, social, and governance performance.*

*H5: Chief executive officer duality affects environmental, social, and governance performance.*

*H6: Digital corporate governance affects technological innovation.*

*H7: Chief executive officer duality affects company value through technological innovation as a mediation variable.*

*H8: Digital corporate governance affects company value through environmental, social, and governance performance as a mediating variable.*

## 3. METHODOLOGY

### 3.1. Types of research

This study employs a quantitative approach with an explanatory research method, aiming to investigate the causal relationship between *CEO duality*, *DCG*, and *Technological innovation* on *ESG performance* and *Firm value* in public companies in Indonesia. This approach was chosen because it is suitable for identifying and measuring the influence of complex and interrelated variables in the context of corporate governance and sustainability. The design of this study adheres to quantitative principles as described by Creswell and Creswell (2017) and Hair et al. (2014), which emphasize the importance of empirical validity and the generalizability of findings.

### 3.2. Population and sample

The population in this study comprises all companies listed on the Indonesia Stock Exchange (IDX) from 2020 to 2024. The sampling technique was carried out by purposive sampling, with inclusion criteria including: 1) companies that consistently publish annual reports and sustainability reports, 2) have accessible data related to the structure of the board of directors, digital governance practices, and *Technological innovation* activities, and 3) provide ESG scores or ESG indicators that can be measured quantitatively. The number of samples was determined based on the minimum statistical considerations for structural equation modeling (SEM) analysis, i.e., at least 100 observations, as suggested by Sekaran and Bougie (2016).

### 3.3. Variable operational definition

To ensure clarity and empirical rigor, each variable in this study is operationally defined based on established theoretical constructs and validated measurement indicators. The variables are categorized into independent, mediating, and dependent constructs, as follows:

**Table 1.** Operational definitions and variable measurements

Variable	Operational definition	Source
<i>CEO duality</i>	CEO duality occurs when one individual serves as both CEO and chairman of the board of directors (Chairman) simultaneously — measured by dummy variables: 1 = duality, 0 = non-duality.	García-Ramos and Díaz Díaz (2020), Mohapatra et al. (2025)
<i>DCG</i>	The level of digitalization in corporate governance practices, such as the use of e-voting, technology-based transparency, and digital reporting, is increasing. Measured through the digital governance index.	Yang et al. (2024), Liu and Feng (2025)
<i>Technological innovation</i>	Technological innovation is measured through the ratio of R&D spending to total assets or revenue, or the number of patents a company owns.	Mathias et al. (2024), Zhang and Zhang (2025)
<i>ESG performance</i>	ESG performance is measured through ESG scores that include environmental, social, and governance dimensions. Data sources can come from Bloomberg, Refinitiv, or local ESG indices.	da Cunha et al. (2025), Cui (2024)
<i>Firm value</i>	Company value is measured using Tobin's Q.	Rahmaniati and Ekawati (2024), Febrianto et al. (2025)

### 3.4. Data analysis technique

This study employs SEM-PLS using SmartPLS software to evaluate both the measurement and structural models. The analytical procedure is divided into two main stages:

#### 3.4.1. Measurement model evaluation

To assess the validity and reliability of reflective indicators, the following criteria are applied:

- a) Convergent validity is confirmed when:
  - Outer loadings exceed 0.70 (Hair & Alamer, 2022).
  - Average variance extracted (AVE) is greater than 0.50.
  - Composite reliability (CR) surpasses 0.70.
- b) Discriminant validity is evaluated using:
  - The heterotrait-monotrait (HTMT) ratio, which must be below 0.85.
  - The Fornell-Larcker criterion ensures that the square root of AVE for each construct is greater than its correlations with other constructs.

For formative indicators, the following diagnostics are conducted:

- Indicator significance, with outer weights tested for statistical significance ( $p < 0.05$ ).
- Multicollinearity assessment, using the variance inflation factor (VIF), which must be below 3.3.
- Outer weights analysis, to determine the relative contribution of each indicator to the construct.

#### 3.4.2. Structural model evaluation

The overall goodness-of-fit of the structural model is evaluated using:

- Standardized root mean square residual (SRMR), which should be less than 0.08.
- Normed fit index (NFI), which must exceed 0.90.
- Root mean square residual covariance (RMS\_theta), which should be below 0.12.

Hypotheses are tested using the bootstrapping technique with 5,000 subsamples.

- A two-tailed test is applied at a significance level of  $\alpha = 5\%$ .
- Critical t-values must exceed 1.96 to indicate statistical significance.

Mediation effects are examined through specific indirect paths, and the variance accounted for (VAF) metric:

- VAF > 80% indicates full mediation.
- $20\% \leq \text{VAF} \leq 80\%$  indicates partial mediation.
- VAF < 20% indicates no mediation.

Alternative research methods, although this study adopts a quantitative approach using SEM-PLS, several alternative methods may offer complementary or substitute insights depending on research goals and data characteristics:

1. Covariance-based structural equation modeling (CB-SEM). Ideal for theory confirmation with large samples and normal data distribution; emphasizes model fit and reflective constructs.

2. Multiple regression. Suitable for testing direct, moderated, or mediated relationships using established frameworks like Baron and Kenny or PROCESS macro.

3. Qualitative case study. This text provides rich contextual understanding of governance, innovation, and ESG practices through interviews, documents, and field observations.

4. Mixed-methods. This approach combines quantitative rigor with qualitative depth, enabling triangulation and contextual validation — especially relevant in emerging markets.

5. Fuzzy set qualitative comparative analysis (fsQCA). This study explores causal complexity and multiple pathways to firm value, effective for small to medium samples and configurational analysis.

## 4. RESULT

This study employs the SEM-PLS to investigate the relationship between *CEO duality*, *DCG*, *Technological innovation*, *ESG performance*, and *Firm value*. The analysis was conducted using SmartPLS software version 4.0, employing a bootstrapping method with 5,000 resamples.

### 4.1. Validity convergence

Convergent validity was tested through outer loading, AVE, and CR values. The test results showed that all indicators had a loading value greater than 0.7, an AVE greater than 0.5, and a CR greater than 0.7, indicating that the construct meets the convergence validity requirements.

**Table 2.** Validity and reliability test results

Construct	AVE	CR	Information
<i>CEO duality</i>	0.612	0.841	Valid and reliable
<i>DCG</i>	0.658	0.873	Valid and reliable
<i>Technological innovation</i>	0.701	0.889	Valid and reliable
<i>ESG performance</i>	0.674	0.861	Valid and reliable
<i>Firm value</i>	0.693	0.879	Valid and reliable

## 4.2. Discriminatory validity

The discriminant validity test was carried out using the Fornell-Larcker and HTMT ratio criteria.

All HTMT values < 0.85, indicating that the construct has adequate discrimination (valid and reliable).

**Table 3.** Hypothesis testing results

<i>Hypothesis</i>	<i>Correlation</i>	<i>Koefisien (<math>\beta</math>)</i>	<i>p-value</i>	<i>Information</i>
H1	CEO duality → Firm value	-0.214	0.004	Significant (-)
H2	DCG → Firm value	0.287	0.000	Significant (+)
H3	CEO duality → Technological innovation	-0.198	0.031	Significant (-)
H4	DCG → ESG performance	0.312	0.000	Significant (+)
H5	CEO duality → ESG performance	-0.176	0.042	Significant (-)
H6	DCG → Technological innovation	0.294	0.002	Significant (+)
H7	CEO duality → Technological innovation → Firm value	-0.089	0.018	Significant mediation
H8	DCG → ESG performance → Firm value	0.124	0.006	Significant mediation

## 4.3. Goodness-of-fit model

The value of R<sup>2</sup> indicates that the model has good predictive power over dependent variables:

<i>Variable dependency</i>	<i>R<sup>2</sup></i>	<i>Information</i>
Firm value	0.52	Moderate
ESG performance	0.47	Moderate
Technological innovation	0.43	Moderate

The SRMR value of 0.062 < 0.08 indicates that the model has a good level of conformity.

## 5. DISCUSSION

### 5.1. The influence of chief executive officer duality on company values

Empirical findings indicate that CEO duality has a negative and significant impact on a company's value. These results suggest that concentrating executive power and oversight in a single individual has the potential to create conflicts of interest and reduce the effectiveness of governance mechanisms. Theoretically, this aligns with agency theory (Jensen & Meckling, 1976), which emphasizes the importance of separating executive and supervisory functions to minimize managerial opportunistic behavior.

In the context of emerging markets, such as Indonesia, the practice of CEO duality remains prevalent, particularly in family-owned companies and conglomerates. This structure tends to hinder an objective and accountable decision-making process, thus impacting investors' perception of the company's value. The study by García-Ramos and Díaz Díaz (2020) showed that separating the CEO and chairman roles significantly improves board efficiency and stock market performance, supporting the findings of this study.

### 5.2. The influence of digital corporate governance on company value

Digitalization in corporate governance has been shown to have a positive impact on company value. DCG, which involves using information technology in reporting, oversight, and decision-making, fosters increased transparency, operational efficiency, and stakeholder engagement. These findings are consistent with the resource-based view (Yang et al., 2024), which states that digital capabilities are strategic resources that can create a competitive advantage.

Research by Wang and Yang (2024) confirms that companies that adopt digital-based governance

systems show significant improvements in market value and corporate reputation. In the Indonesian context, digital governance is a crucial instrument for bridging the information gap and strengthening investor confidence, particularly in the post-pandemic era, which demands significant technological adaptation.

### 5.3. The influence of chief executive officer duality on technological innovation

Chief executive officer duality was also found to harm the company's technological innovation capabilities. Centralized leadership structures often hinder the process of exploring new ideas and taking risks, which are crucial in R&D activities. The perspective of dynamic capabilities (Azzam, 2022) emphasizes that an organization's flexibility in responding to environmental changes is highly dependent on an adaptive and collaborative leadership structure.

A study by Mathias et al. (2024) shows that companies with more independent and participatory boards have a higher level of innovation, both in terms of products and processes. Thus, CEO duality can be a significant obstacle in innovation-based value creation.

### 5.4. The influence of digital corporate governance on environmental, social, and governance performance

Digital corporate governance has a positive impact on ESG performance. Digitalization enables companies to manage and report on sustainability activities with greater accuracy, structure, and in real-time. This strengthens accountability and increases stakeholder engagement in the sustainability agenda.

These findings align with the study by da Cunha et al. (2025), which demonstrated that integrating technology into ESG reporting enhances the sustainability score and interest of institutional investors. Within the framework of stakeholder theory (Al-Shaer et al., 2023), digital governance expands the space for dialogue between companies and external communities, thereby strengthening social legitimacy and long-term sustainability.

### 5.5. Chief executive officer duality's influence on environmental, social, and governance performance

The CEO duality structure has been proven to harm ESG performance. The concentration of power in one individual tends to reduce commitment to social

and environmental responsibility and hinder a transparent reporting process. In the context of sustainability-oriented governance, the role of an independent board is crucial in ensuring that the ESG agenda is implemented consistently and effectively integrated.

Research by Suherman et al. (2023) shows that companies with more distributed board structures have higher ESG scores, especially in environmental and social aspects. This strengthens the argument that CEO duality impacts not only the financial aspect but also the company's reputation and legitimacy in the eyes of the public.

### 5.6. The influence of digital corporate governance on technological innovation

Digital corporate governance has a positive effect on technological innovation. The use of technology in the governance process drives efficiency, accelerates decision-making, and opens up space for the exploration of new ideas. Within the framework of dynamic capabilities, digitalization enhances a company's ability to integrate and reconfigure internal resources in response to external changes.

A study by Wang and Yang (2024) shows that companies adopting digital governance are faster in developing technology-based products and services and are more adaptive to market disruptions. These findings confirm that digitalization is not only a tool of efficiency but also a catalyst for innovation.

### 5.7. The role of mediation in technology innovation and environmental, social, and governance performance

The mediation analysis reveals that technological innovation significantly mediates the relationship between CEO duality and company value. This means that the negative impact of CEO duality on company value mostly occurs through barriers to innovation. In contrast, ESG performance mediates the relationship between DCG and corporate value, suggesting that digitalization of governance increases corporate value through improved sustainability performance.

These findings support an integrated governance approach, where innovation and sustainability are positioned as strategic pathways in value creation. In this context, an adaptive and technology-based governance structure is a key prerequisite for companies to survive and thrive in a dynamic and complex business environment.

## 6. CONCLUSION

This study provides empirical evidence on the complex interplay between CEO duality, DCG, technological innovation, ESG performance, and firm value within the context of Indonesian public companies. The findings reveal that CEO duality exerts a negative influence on firm value, both directly and indirectly, by constraining innovation and sustainability efforts. In contrast, DCG demonstrates a positive and significant impact on technological innovation and ESG performance, which in turn enhances firm value.

By integrating agency theory and dynamic capabilities theory, this research contributes to the growing body of literature on corporate governance in emerging markets. It highlights the strategic importance of separating leadership roles and investing in digital governance infrastructure to foster innovation and long-term value creation. Furthermore, the mediating roles of technological innovation and ESG performance underscore their relevance as operational levers for translating governance quality into financial outcomes.

From a managerial perspective, the study suggests that boards and policymakers should prioritize governance structures that promote transparency, accountability, and digital transformation. Firms aiming to improve market valuation should not only focus on financial metrics but also embed innovation and sustainability into their core strategies. Future research may extend this model by incorporating cross-country comparisons, longitudinal designs, or qualitative insights to deepen understanding of governance dynamics in different institutional settings.

This research has several limitations. First, the use of cross-sectional data from Indonesian public companies for the 2020-2024 period limits the analysis of long-term dynamics. Second, ESG performance measurement and technological innovation rely on secondary data that has not been fully standardized, so it has the potential to cause bias. Third, focusing on the Indonesian context limits generalization to other countries with different institutional characteristics. Finally, the SEM-PLS method employed has not thoroughly addressed the issue of endogeneity, so the results should be interpreted with caution.

## REFERENCES

- Agbakwuru, V., Onyenahazi, O. B., Antwi, B. O., & Oyewale, K. (2024). The impact of environmental, social, and governance (ESG) reporting on corporate financial performance. *International Journal of Research Publication and Reviews*, 5(9), 3629-3644. <https://doi.org/10.55248/gengpi.5.0924.2710>
- Ahmed, S. (2025). Enhancing data security and transparency: The role of blockchain in decentralized systems. *International Journal of Advanced Engineering, Management and Science*, 11(1), 167-176. <https://doi.org/10.22161/ijaems.111.12>
- Al-Shaer, H., Uyar, A., Kuzey, C., & Karaman, A. S. (2023). Do shareholders punish or reward excessive CSR engagement? Moderating effect of cash flow and firm growth. *International Review of Financial Analysis*, 88, Article 102672. <https://doi.org/10.1016/j.irfa.2023.102672>
- Alsulami, F. (2025). Digital innovation and sustainable accounting practices: A systematic literature review through the governance context. *Journal of Governance & Regulation*, 14(1), 38-48. <https://doi.org/10.22495/jgrv14i1art4>
- Anderson, L. (2014). 'Creative destruction': States, identities and legitimacy in the Arab world: States, identities and legitimacy in the Arab world. *Philosophy & Social Criticism*, 40(4-5), 369-379. <https://doi.org/10.1177/0191453714522478>

- Azzam, A. (2022). Board gender diversity and innovation activities: Evidence from R&D investments in the UK. *Cogent Business & Management*, 9(1), Article 2154056. <https://doi.org/10.1080/23311975.2022.2154056>
- Besim, S. (2023). The impact of control structures on firm value. *Borsa Istanbul Review*, 23(5), 1001–1012. <https://doi.org/10.1016/j.bir.2023.05.001>
- Beulen, E., & Bode, R. (2021). An information technology and innovation committee to guide digital transformations. *Corporate Board: Role Duties and Composition*, 17(2), 38–53. <https://doi.org/10.22495/cbv17i2art4>
- Bhat, B. A., Makkar, M. K., & Gupta, N. (2023). Corporate board structure and ESG performance: An empirical study of listed firms in the emerging market. *Corporate Governance and Sustainability Review*, 7(2), 8–17. <https://doi.org/10.22495/cgsrv7i2p1>
- Bukari, A., Agyemang, A. O., & Bawuah, B. (2024). Assessing the moderating role of ESG performance on corporate governance and firm value in developing countries. *Cogent Business & Management*, 11(1), Article 2333941. <https://doi.org/10.1080/23311975.2024.2333941>
- Creswell, J. W., & Creswell, J. D. (Eds.). (2017). Mixed methods procedures. In *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.
- Cui, J. (2024). *Corporate green ESG performance and digital innovation technology: An empirical analysis*. <https://doi.org/10.2139/ssrn.5066510>
- da Cunha, Í. G. F., Policarpo, R. V. S., de Oliveira, P. C. S., Abdala, E. C., & do Nascimento Rebelatto, D. A. (2025). A systematic review of ESG indicators and corporate performance: Proposal for a conceptual framework. *Future Business Journal*, 11, Article 106. <https://doi.org/10.1186/s43093-025-00539-1>
- Debnath, P., Das, P., Laskar, N., Khan, S. B., Dhand, S., & Kaushal, K. (2021). CEO duality and firm performance: An empirical study on listed companies from an emerging market [Special issue]. *Corporate Governance and Organizational Behavior Review*, 5(2), 194–202. <https://doi.org/10.22495/cgobrv5i2sip7>
- Doku, J. N., Abdul-Razak Borowa, H., Mohammed, I., & Attah-Botchwey, E. (2023). Impact of corporate board size and board independence on stock returns volatility in Ghana. *Cogent Business & Management*, 10(2), Article 2204597. <https://doi.org/10.1080/23311975.2023.2204597>
- Duque-Grisales, E., Aguilera-Caracuel, J., Guerrero-Villegas, J., & García-Sánchez, E. (2020). Does green innovation affect the financial performance of multinationals? The moderating role of ISO 14001 and R&D investment. *Business Strategy and the Environment*, 29(8), 3286–3302. <https://doi.org/10.1002/bse.2572>
- Dwianika, A., Purwanto, E., Suyoto, Y. T., & Pitaloka, E. (2024). Bibliometrics analysis of green accounting research. *International Journal of Energy Economics and Policy*, 14(1), 349–358. <https://doi.org/10.32479/ijeep.15055>
- Febrianto, H. G., Pambudi, J. E., Sunaryo, D., Fitriana, A. I., & Dehavilan, S. (2025). Tax avoidance and green accounting in increasing firm value and CSR practices in Indonesia. *Jurnal Reviu Akuntansi Dan Keuangan*, 15(1), 33–50. <https://doi.org/10.22219/jrak.v15i1.34304>
- García-Ramos, R., & Díaz Díaz, B. (2020). Chief executive officer (CEO duality). In S. Idowu, R. Schmidpeter, N. Capaldi, L. Zu, M. Del Baldo, & R. Abreu (Eds.), *Encyclopedia of sustainable management* (pp. 1–4). Springer. [https://doi.org/10.1007/978-3-030-02006-4\\_489-1](https://doi.org/10.1007/978-3-030-02006-4_489-1)
- García-Sánchez, I.-M., Hussain, N., Khan, S. A., & Martínez-Ferrero, J. (2020). Managerial entrenchment, corporate social responsibility, and earnings management. *Corporate Social Responsibility and Environmental Management*, 27(4), 1818–1833. <https://doi.org/10.1002/csr.1928>
- Grove, H., Clouse, M., Schaffner, L., & Xu, T. (2020). Monitoring AI progress for corporate governance. *Journal of Governance & Regulation*, 9(1), 8–17. <https://doi.org/10.22495/jgrv9i1art1>
- Hacioglu, U., & Aksoy, T. (Eds.). (2021). *Financial ecosystem and strategy in the digital era: Global approaches and new opportunities*. Springer. <https://doi.org/10.1007/978-3-030-72624-9>
- Hair, J. F., Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis* (7th ed.). Pearson.
- Hair, J., & Alamer, A. (2022). Partial least squares structural equation modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, 1(3), Article 100027. <https://doi.org/10.1016/j.rmal.2022.100027>
- Hanisch, M., Goldsby, C. M., Fabian, N. E., & Oehmichen, J. (2023). Digital governance: A conceptual framework and research agenda. *Journal of Business Research*, 162, Article 113777. <https://doi.org/10.1016/j.jbusres.2023.113777>
- Huang, Y., & Zhang, Q. (2025). Patient capital and corporate ESG performance: Empirical evidence from the Chinese stock market. *International Review of Economics & Finance*, 103, Article 104453. <https://doi.org/10.1016/j.iref.2025.104453>
- Iazzolino, G., Bruni, M. E., Veltri, S., Morea, D., & Baldissarro, G. (2023). The impact of ESG factors on financial efficiency: An empirical analysis for the selection of sustainable firm portfolios. *Corporate Social Responsibility and Environmental Management*, 30(4), 1917–1927. <https://doi.org/10.1002/csr.2463>
- Jagirani, T. S., Chee, L. C., & Kosim, Z. B. (2023). Board characteristics and firm value: The moderating role of capital adequacy. *Investment Management and Financial Innovations*, 20(2), 205–214. [https://doi.org/10.21511/imfi.20\(2\).2023.18](https://doi.org/10.21511/imfi.20(2).2023.18)
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
- Jie, H., Gooi, L. M., & Lou, Y. (2025). Digital maturity, dynamic capabilities and innovation performance in high-tech SMEs. *International Review of Economics & Finance*, 99, Article 103971. <https://doi.org/10.1016/j.iref.2025.103971>
- Ju Ahmad, N. B., Rashid, A., & Gow, J. (2017). CEO duality and corporate social responsibility reporting: Evidence from Malaysia. *Corporate Ownership & Control*, 14(2), 69–81. <https://doi.org/10.22495/cocv14i2art7>
- Kumandang, C., & Hendriyani, N. S. (2021). Corporate social responsibility, corporate governance dan manajemen laba pada perusahaan manufaktur di Indonesia tahun 2015–2019 [Corporate social responsibility, corporate governance and profit management in manufacturing companies in Indonesia 2015–2019]. *Journal of Management and Business Review*, 18(2), 193–208. <https://doi.org/10.34149/jmbr.v18i2.273>
- Lane, J. N., Leonardi, P. M., Contractor, N. S., & DeChurch, L. A. (2024). Teams in the digital workplace: Technology's role for communication, collaboration, and performance. *Small Group Research*, 55(1). <https://doi.org/10.1177/10464964231200015>
- Liu, L., & Feng, Y. (2025). Government digital governance and corporate investment efficiency. *Finance Research Letters*, 77, Article 107018. <https://doi.org/10.1016/j.frl.2025.107018>

- Masud, M. A. K., Sahara, J., Maola, M., & Rahman, M. (2025). Enhancing ESG performance through corporate governance: Insights from emerging markets. *International Journal of Energy Economics and Policy*, 15(1), 47-58. <https://doi.org/10.32479/ijeep.17717>
- Mathias, T., Fertig, M. B., Zancanaro, M., Thibes, R. F., & Hahn, I. S. (2024). Defining innovation: A comprehensive analysis of types, levels, and strategic interactions. *IOSR Journal of Humanities and Social Science*, 29(9), 28-36. <https://www.iosrjournals.org/iosr-jhss/papers/Vol.29-Issue9/Ser-2/E2909022836.pdf>
- Mikrad, Febrianto, H. G., & Pambudi, J. E. (2022). CEO duality and corporate value: A digital corporate governance perspective. *Jurnal Reviu Akuntansi dan Keuangan*, 14(4), 912-932. <https://doi.org/10.22219/jrak.v14i4.33888>
- Mohapatra, S., Kumar, A., Mohapatra, M. R., & Srivastava, V. (2025). Does CEO duality moderate environmental, social, and governance performance-earnings management relationship? Evidence from emerging markets. *Finance Research Letters*, 73, Article 106616. <https://doi.org/10.1016/j.frl.2024.106616>
- Omar, A., & Owusu-Amoako, J. (2023). The role of corporate governance mechanisms on equity overvaluation. *Corporate Governance and Sustainability Review*, 7(3), 34-44. <https://doi.org/10.22495/cgsrv7i3p3>
- Rahmaniati, N. P. G., & Ekawati, E. (2024). The role of Indonesian regulators on the effectiveness of ESG implementation in improving firms' non-financial performance. *Cogent Business & Management*, 11(1), Article 2293302. <https://doi.org/10.1080/23311975.2023.2293302>
- Ren, G., Huo, Z., Wang, J., & Liu, X. (2023). Corporate digital transformation and M&A efficiency: Evidence based on Chinese listed companies. *International Journal of Financial Studies*, 11(4), Article 137. <https://doi.org/10.3390/ijfs11040137>
- Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill-building approach* (7th ed.). Wiley.
- Suherman, S., Mahfirah, T. F., Usman, B., Kurniawati, H., & Kurnianti, D. (2023). CEO characteristics and firm performance: Evidence from a Southeast Asian country. *Corporate Governance*, 23(7), 1526-1563. <https://doi.org/10.1108/CG-05-2022-0205>
- Sun, Y., Xu, C., Ding, R., & Cao, Y. (2023). Does innovation in environmental, social, and governance disclosures pay off in China? An integrated reporting perspective. *Borsa Istanbul Review*, 23(3), 600-613. <https://doi.org/10.1016/j.bir.2023.01.001>
- Tang, L., Gu, Z., Zhang, Q., & Liu, J. (2022). The effect of firm size, industry type and ownership structure on the relationship between firms' sustainable innovation capability and stock liquidity. *Operations Management Research*, 15, 825-837. <https://doi.org/10.1007/s12063-021-00241-9>
- Uddin, M. N., Hosen, M., Chowdhury, M. M., Tabassum, T., & Mazumder, M. A. (2021). Does corporate governance influence firm value in Bangladesh? A panel data analysis. *E&M Ekonomie a Management*, 24(2), 84-100. <https://surl.li/ershdf>
- Uzliawati, L., Taqi, M., Muchlish, M., & Kalbuana, N. (2023). The transformation of corporate reputation driven by corporate governance, environmental social, and governance (ESG), business activity, and profitability in Indonesia. *Review of Economics and Finance*, 21, 1295-1305. [https://refpress.org/wp-content/uploads/2023/09/Kalbuana\\_REF.pdf](https://refpress.org/wp-content/uploads/2023/09/Kalbuana_REF.pdf)
- Wang, L., & Yang, H. (2024). Digital technology innovation and corporate ESG performance: Evidence from China. *Economic Change and Restructuring*, 57, Article 207. <https://doi.org/10.1007/s10644-024-09791-x>
- Wijethilake, C., & Ekanayake, A. (2020). CEO duality and firm performance: The moderating roles of CEO informal power and board involvements. *Social Responsibility Journal*, 16(8), 1453-1474. <https://doi.org/10.1108/SRJ-12-2018-0321>
- Wu, L., Yi, X., Hu, K., Lyulyov, O., & Pimonenko, T. (2024). The effect of ESG performance on corporate green innovation. *Business Process Management Journal*, 31(8), 24-48. <https://doi.org/10.1108/BPMJ-04-2023-0237>
- Wu, S., & Li, Y. (2023). A study on the impact of digital transformation on corporate ESG performance: The mediating role of green innovation. *Sustainability*, 15(8), Article 6568. <https://doi.org/10.3390/su15086568>
- Yan, X., Zhang, Y., & Pei, L.-L. (2021). The impact of risk-taking level on green technology innovation: Evidence from energy-intensive listed companies in China. *Journal of Cleaner Production*, 281, Article 124685. <https://doi.org/10.1016/j.jclepro.2020.124685>
- Yang, Q., & Jin, S. (2024). Exploring the impact of digital transformation on manufacturing environment, social responsibility, and corporate governance performance: The moderating role of top management teams. *Sustainability*, 16(11, special issue), Article 4342. <https://doi.org/10.3390/su16114342>
- Yang, S., Tai, Y., & Liu, J. (2024). Mechanism analysis and path study of digital transformation on corporate governance: Evidence from Chinese listed companies. *Sustainability*, 16(21, special issue), Article 9245. <https://doi.org/10.3390/su16219245>
- Yu, M. (2023). CEO duality and firm performance: A systematic review and research agenda. *European Management Review*, 20(2), 346-358. <https://doi.org/10.1111/emre.12522>
- Zahid, Z., Zhang, J., Ali, F., & Shahzad, F. (2024). Board diversity and firm performance in Chinese manufacturing firms: Moderating role of CEO duality. *BRQ Business Research Quarterly*, 28(4). <https://doi.org/10.1177/23409444241290253>
- Zhang, L., & Zhang, X. (2025). Impact of digital government construction on the intelligent transformation of enterprises: Evidence from China. *Technological Forecasting and Social Change*, 210, Article 123787. <https://doi.org/10.1016/j.techfore.2024.123787>
- Zhao, X., & Cai, L. (2023). Digital transformation and corporate ESG: Evidence from China. *Finance Research Letters*, 58(Part A), Article 104310. <https://doi.org/10.1016/j.frl.2023.104310>